SEQUENCE LISTING

<110> Meyers, Rachel Cook, William James Williamson, Mark Rudolph-Owen, Laura A. Gimeno, Ruth
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age Se:	c ag r Ar	g G	gc to ly C 70	gc co ys Pi	eg eg	gg A	la T	gg ga rp As 75	ac ca sp G	ag g ln G	ag g lu A	ila c	ag ç lu 6 80	gly	gca Ala	ı ggc ı Gly	2411

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Leu Lys Pro Glu His Arg Asn Ser Val Pro Cys Gln Asp Pro Ile Thr 50 55 60

Gly Glu Asn Leu Ala Ser Cys Leu Gln Ala Gln Ala Glu Asp Val Ala 65 70 75 80

Ala Ala Val Glu Ala Ala Arg Met Ala Phe Lys Gly Trp Ser Ala His 85 90 95

Pro Gly Val Val Arg Ala Gln His Leu Thr Arg Leu Ala Glu Val Ile 100 105 110

Gln Lys His Gln Arg Leu Leu Trp Thr Leu Glu Ser Leu Val Thr Gly 115 120 125

Arg Ala Val Arg Glu Val Arg Asp Gly Asp Val Gln Leu Ala Gln Gln 130 135 140

Leu Leu His Tyr His Ala Ile Gln Ala Ser Thr Gln Glu Glu Ala Leu 145 150 155 160

Ala Gly Trp Glu Pro Met Gly Val Ile Gly Leu Ile Leu Pro Pro Thr 165 170 175 、

Phe Ser Phe Leu Glu Met Met Trp Arg Ile Cys Pro Ala Leu Ala Val 180 185 190

Gly Cys Thr Val Val Ala Leu Val Pro Pro Ala Ser Pro Ala Pro Leu 195 200 205 Leu Leu Ala Gln Leu Ala Gly Glu Leu Gly Pro Phe Pro Gly Ile Leu 210 215 220

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Leu Gly Thr Glu Ser Leu Leu Leu Leu Thr Asp Thr Ala Asp Val Asp 275 280 285

Ser Ala Val Glu Gly Val Val Asp Ala Ala Trp Ser Asp Arg Gly Pro 290 295 300

Gly Gly Leu Arg Leu Leu Ile Gln Glu Ser Val Trp Asp Glu Ala Met 305 310 315

Arg Arg Leu Gln Glu Arg Met Gly Arg Leu Arg Ser Gly Arg Gly Leu 325 330 335

Asp Gly Ala Val Asp Met Gly Ala Arg Gly Ala Ala Ala Cys Asp Leu 340 345 350

Val Gln Arg Phe Val Arg Glu Ala Gln Ser Gln Gly Ala Gln Val Phe 355 360 365

Gln Ala Gly Asp Val Pro Ser Glu Arg Pro Phe Tyr Pro Pro Thr Leu 370 375 380

Val Ser Asn Leu Pro Pro Ala Ser Pro Cys Ala Gln Val Glu Val Pro 385 390 395 400

Trp Pro Val Val Val Ala Ser Pro Phe Arg Thr Ala Lys Glu Ala Leu 405 410 415

Leu Val Ala Asn Gly Thr Pro Arg Gly Gly Ser Ala Ser Val Trp Ser 420 425 430

Glu Arg Leu Gly Gln Ala Leu Glu Leu Gly Tyr Gly Leu Gln Val Gly 435 440 445

Thr Val Trp Ile Asn Ala His Gly Leu Arg Asp Pro Ser Val Pro Thr 450 455 460

Gly Gly Cys Lys Glu Ser Gly Cys Ser Trp His Gly Gly Pro Asp Gly 465 470 475

Leu Tyr Glu Tyr Leu Arg Pro Ser Gly Thr Pro Ala Arg Leu Ser Cys 485 490 495

Leu Ser Lys Asn Leu Asn Tyr Asp Thr Phe Gly Leu Ala Val Pro Ser 500 505

Thr Leu Pro Ala Gly Pro Glu Ile Gly Pro Ser Pro Ala Pro Pro Tyr 515 520 525

Gly Leu Phe Val Gly Gly Arg Phe Gln Ala Pro Gly Ala Arg Ser Ser 530 535

Arg Pro Ile Arg Asp Ser Ser Gly Asn Leu His Gly Tyr Val Ala Glu 545 555 560

Gly Gly Ala Lys Asp Ile Arg Gly Ala Val Glu Ala Ala His Gln Ala 565 570 575

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Glu Leu Ser Ala Arg Arg Leu Arg Ala Trp Gly Ala Arg Val Gln Ala 625 630 635 640

Gln Gly His Thr Leu Gln Val Ala Gly Leu Arg Gly Pro Val Leu Arg 645 650 655

Leu Arg Glu Pro Leu Gly Val Leu Ala Val Val Cys Pro Asp Glu Trp 660 665 670

Pro Leu Leu Ala Phe Val Ser Leu Leu Ala Pro Ala Leu Ala Tyr Gly 675 680 685

Asn Thr Val Val Met Val Pro Ser Ala Ala Cys Pro Leu Leu Ala Leu 690 695 700

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gag Glu 625	Le	g ag u Se	r Al	a Ar	g Ar	g Le	u Ar	g gc g Al	a Tr	b GI	-y Al	ec co La Ar	ig gt	ig c	ag Sln	gcc Ala 640	1920
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ctç Lei	g cg ı Ar	g ga g G]	Lu Pi	eg et ro Le 60	eu G	gt gt Ly Va	ig ct al Le	g go eu Al 66	a va	ig g	tg to	gt co ys P.	LO A	ac (sp (gag Glu	tgg Trp	2016
cco Pro	c ct o Le	u Le	eu A 75	cc ti la Pi	tc g he V	tg to	er Le	tg ct eu Le 80	eu A	ct c la P	cc g ro A	та ь	tg g eu A 85	cc la	tac Tyr	ggc Gly	2064
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aag Lys	aca Thr	Phe	acc Thi	c cca	aaq Lys	g cto Lei 95	ı val	ct Le	g t u I	tg .eu	gac Asp	cto Lev 10	u 50	ca (er <i>l</i>	gac Asp	atc Ile	a S	gc er	642
tgt Cys 105	Val	cca Pro	a ga [.] o As _l	c gto	g gca l Ala 110	a aaa a Lys	a gaa s Glu	a gt ı Va	с с 1 І	ctg Leu	gat Asp 115	, су	c ta s T	at (yr (ggc Gly	tgt Cys	-	tg al 20	690
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aac Lys	g att	t tc e Se	t ct r Le 14	u Gl	g ct u Le	c ga u As	c aa p Ly	s ri	ag ys 45	atc. Ile	ato Met	g ga : As	it g sp A	ccla	aat Asn 150	- 1	c t	tt Phe	786
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at Il 18	e Pr	g ti	cc cone A	gt ao rg Tl	ar Tl	et ta nr Ty 90	ac go yr Al	ct g la A	Jа	Sei	e aa Ly 19	's H	15	HIA	HI	а ве	·u	ggc Gly 200	930
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aç Se	gc ad er Tl	cc g nr V	al S	gc c er P 20	cg a ro T	ct t hr P	tc a he I	le A	egg Arg 225	Se	g ta r Ty	ac c yr H	ac	gtg Val	ta Ty 23	1 1	ca	gag Glu	1026
G:	aa g ln G	ly P	ac t sn 1	gg g	aa g lu A	ct t .la S	er I	tt 1 le 1	tgg Irp	aa Ly	a ti s Pl	tc t he E	tt Phe	tto Phe 245	s Wr	ıg a	ag ys	ctg Leu	1074
a T	hr T	ac q yr (ggc (gtg (/al H	ac c lis E	ca ç ro V	ta ç al 0 255	gag Slu	gtg Val	gc Al	g g .a G	Iu (gag Glu 260	gto Va	g at 1 Me	et A	gc rg	acc Thr	1122

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ctg ctt ccc aac Leu Leu Pro Asn	atg atc tcc Met Ile Ser 165	cgg aga ac Arg Arg Th 17	r GIA GIU IIE A	tg tta gtg 528 al Leu Val 175
aat aat atc caa Asn Asn Ile Gln 180	ggg aag ttt Gly Lys Phe	gga atc cc Gly Ile Pr 185	o Phe Arg Int	act tac gct 576 Thr Tyr Ala 190
gcc tcc aag cac Ala Ser Lys His 195	gca gcc ctg Ala Ala Leu	g ggc ttc tt n Gly Phe Ph 200	t gac tgc ctc o e Asp Cys Leu i 205	ega gee gaa 624 Arg Ala Glu
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Trp Leu Glu Glu Leu Lys Thr Gly Pro Val Arg Val Thr Ala Ile Gln

Gly Asp Val Thr Gln Ala His Glu Val Ala Ala Ala Val Ala Gly Ala

His Val Val Ile His Thr Ala Gly Leu Val Asp Val Phe Gly Arg Ala

Ser Pro Lys Thr Ile His Glu Val Asn Val Gln Gly Thr Arg Asn Val 105

Ile Glu Ala Cys Val Gln Thr Gly Thr Arg Phe Leu Val Tyr Thr Ser 120

Ser Met Glu Val Val Gly Pro Asn Thr Lys Gly His Pro Phe Tyr Arg 135

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Cys Ser Lys Ala Leu Ala Glu Trp Leu Val Leu Glu Ala Asn Gly Arg 170 165

Lys Val Arg Gly Gly Leu Pro Leu Val Thr Cys Ala Leu Arg Pro Thr

Gly Ile Tyr Gly Glu Gly His Gln Ile Met Arg Asp Phe Tyr Arg Gln 200

Gly Leu Arg Leu Gly Gly Trp Leu Phe Arg Ala Ile Pro Ala Ser Val 215 210

Glu His Gly Arg Val Tyr Val Gly Asn Val Ala Trp Met His Val Leu 235

Ala Ala Arg Glu Leu Glu Gln Arg Ala Ala Leu Met Gly Gly Gln Val

Tyr Phe Cys Tyr Asp Gly Ser Pro Tyr Arg Ser Tyr Glu Asp Phe Asn 265

Met	Glu	Ph 27		eu	Gly	Pro	Cys	G1 28	y L∈ O	eu A	rg	Leu	Va	1 G 2	ly . 85	Ala	Ar	g P:	ro		
Leu	Let 290		ro T	yr	Trp	Leu	Leu 295	Va	1 Pì	ne I	eu	Ala	A1 30	a L O	eu	Asn	Al	a L	eu		
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Pro	Ту	r Tl	hr l	Leu	Ala 325	Val	Ala	a As	n T	hr :	thr 330	Ph∈	e Th	ır V	/al	Ser	Th 33	nr A 35	sp		
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ggc	cto Leu 210	Ar	c cto	g gga u Gly	a ggt y Gly	tgg Trg 215) Lei	c tt u Ph	c one l	egg Arg	gcc Ala	ato 11e 220	; ET.	g gc	c t	tct Ser	gtg Val	672
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tt Le	g ct u Le 29	u Pi	co ta	ac to yr Ti	gg ct	ig ct eu Le 29	eu Va	g t	tc he	cto	g gc ı Al	a A	cc ct la Le	cc a	at Asn	gco	c cto	g 912 u
ct Le 30	u Gl	ng to	gg c	tg ci eu Le	eu A	gg co rg Pi 10	ca ci	tg g eu V	gtg /al	ct o	ta u Ty 31	L A.	ca c la P	cc o	ctg Leu	ct (g aa u As 32	
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aa Ly	ag g ys A	ct c la G	ln A	gc c rg H 40	at t is P	tc g he G	gc t ly T	yr	gag Glu 345	Pr	c ct	tg t eu P	tc t he S	er	tgg Trp 350	91	g ga u As	t 1056 sp

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caa tgc aac atc cgg aat gag gag gtg aat aat ttg gtc aaa tct Gln Cys Asn Ile Arg Asn Glu Glu Glu Val Asn Asn Leu Val Lys Ser 100 105 110	396
acc tta gat act ttt ggt aag atc aat ttc ttg gtg aac aat gga gga Thr Leu Asp Thr Phe Gly Lys Ile Asn Phe Leu Val Asn Asn Gly Gly 115 120 125	444
ggc cag ttt ctt tcc cct gct gaa cac atc agt tct aag gga tgg cac Gly Gln Phe Leu Ser Pro Ala Glu His Ile Ser Ser Lys Gly Trp His 130	492
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att Ile	gtc Val	cct Pro	act Thr 180	aaa Lys	gct Ala	gga Gly	ttt Phe	cca Pro 185	tta Leu	gct Ala	gtg Val	cat His	tct Ser 190	gga Gly	gct Ala	636
gca Ala	aga Arg	gca Ala 195	ggt Gly	gtt Val	tac Tyr	aac Asn	ctc Leu 200	acc Thr	aaa Lys	tct Ser	tta Leu	gct Ala 205	ttg Leu	gaa Glu	tgg Trp	684
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ato Ile	act Thi	gga Gly 27!	y Glr	g tco n Ser	g gto Val	g gat Asp	gtg Val 280	. Asp	ggg Gly	ggo Gly	c cgc / Arc	g agt g Ser 285	. Бес	e tat i Tyr	act Thr	924
cac His	c tco s Se: 29	r Ty	t gad r Gl	g gta u Val	a cca L Pro	a gat o Asp 295	His	gac S Asp	aac Asi	tgo Tr	g cco Pro 300	о га:	g gga s Gly	a gca y Ala	a ggg a Gly	972
ga As 30	p Le	t tc u Se	t gt r Va	t gte l Va	c aaa l Ly: 31	s Ly:	g ato s Me	g aaq t. Ly:	g gad s Glu	g ace i Thi 31	rьe	a aad u Ly:	g gad s Gl	g aaa u Ly:	a gct s Ala 320	1020
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- Leu Gln Ala Asn Leu Pro Pro Thr Lys Gln Ala Arg Val Ile Pro Ile 85 90 95
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- Thr Leu Asp Thr Phe Gly Lys Ile Asn Phe Leu Val Asn Asn Gly Gly 115 120
- Gly Gln Phe Leu Ser Pro Ala Glu His Ile Ser Ser Lys Gly Trp His 130 135 140
- Ala Val Leu Glu Thr Asn Leu Thr Gly Thr Phe Tyr Met Cys Lys Ala 145 150 155 160
- Val Tyr Ser Ser Trp Met Lys Glu His Gly Gly Ser Ile Val Asn Ile 165 170 175
- Ile Val Pro Thr Lys Ala Gly Phe Pro Leu Ala Val His Ser Gly Ala 180 185 190
- Ala Arg Ala Gly Val Tyr Asn Leu Thr Lys Ser Leu Ala Leu Glu Trp 195 200 205
- Ala Cys Ser Gly Ile Arg Ile Asn Cys Val Ala Pro Gly Val Ile Tyr 210 215 220
- Ser Gln Thr Ala Val Glu Asn Tyr Gly Ser Trp Gly Gln Ser Phe Phe 225 230 235 240
- Glu Gly Ser Phe Gln Lys Ile Pro Ala Lys Arg Ile Gly Val Pro Glu 245 250 250
- Glu Val Ser Ser Val Val Cys Phe Leu Leu Ser Pro Ala Ala Ser Phe 260 265 270
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gct (gca (Ala (ggg	atg o Met 1	gcc t Ala S	cc t Ser I	gg g rp A	ct a la I	ag g ys G 25	gc a	agg a Arg :	agc t Ser T	λr r	tg g eu A 30	cg c la F	ct Pro	96
ggt Gly	ttg Leu	ctg Leu 35	cag Gln	ggc (Gly (caa q Gln V	gtg g /al <i>F</i>	jcc a Ala I 40	atc q [le \	gtc /al	acc Thr	ggc g Gly G	199 9 Sly A 45	cc a la T	cg c	ggc Gly	144
atc Ile	gga Gly 50	aaa Lys	gcc Ala	atc Ile	gtg a Val 1	aag q Lys (55	gag (Glu 1	ctc (Leu]	ctg Leu	gag Glu	ctg (Leu (ggg a Gly S	igt a Ser A	at (gtg Val	192
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gc. Al:	a ag a Ar	a gc g Al 19	a Gl	t gti y Val	t tac l Tyr	aac Asr	cto Leu 200	ı Thr	aa Ly	a tc s Se	t tta r Leu	gct Ala 205	ьеи	gaa Glu	a tgg ı Trp	624

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Gly Val Tyr Asn Leu Thr Lys Thr Met Ala Leu Thr Trp Ala Ser Ser 185

Gly Val Arg Ile Asn Cys Val Ala Pro Gly Thr Ile Tyr Ser Gln Thr 200

Ala Val Asp Asn Tyr Gly Glu Leu Gly Gln Thr Met Phe Glu Met Ala 215

Phe Glu Asn Ile Pro Ala Lys Arg Val Gly Leu Pro Glu Glu Ile Ser 235 230

Pro Leu Val Cys Phe Leu Leu Ser Pro Ala Ala Ser Phe Ile Thr Gly 245

Gln Leu Ile Asn Val Asp Gly Gln Ala Leu Tyr Thr Arg Asn Phe

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a cr	r aac	Leu	Met	Ala 5 ttc Phe	Val att	Leu	Met caq	Leu gag	Pro 10 gca Ala	Let tc	ı Lev	ı Leu ı ctg	Lev tgg	tco Sei	, lle	48 96
age Se:	e ggd r Gly	Leu c cto Leu	Met c ctc Leu 20 g cag	Ala 5 ttc Phe	Val att Ile	tac Tyr	Met cag Gln	Leu gag Glu 25 gtc	Pro 10 gca Ala	Lev tco Ser	a Lev	Leu g ctg g Leu	tgg Trp 30 ato	tcq Sei	, lle 5 g aag	
agg Se: tc: Se	t geor Ala	c ctc y Let c gtc a Val a aaa y Ly:	Met ctc	Ala 5 ttc: ttc: Phe acc Asr	Val att Ile aaa Lys	tac Tyr gtg Val	Met cag Gln gtg Val	Leu gag Glu 25 ggtc Val	Pro 10 gca Ala ato Ile	Let too	a gat a gat a gat a gg	t geo	tgg Trr 30 c atc	tcq ftcq Sen) tcc Sen)	g aag c Lys	96
age Se: tc: Se: ct Le	e gge r Gly t gee r Ala g gga u Gl	c ctc y Lev c gtc a Val 3! a aaa y Ly:	Met c ctc l Leu 20 g cac l Glr g gac s Glu	Ala 5 tto Phe 1 aac 1 Cys	Val att Ile aaa Lys gct s Ala	tac Tyr gtg Val cgg Arg Tyr	Met cag Gln gtg Val gtg yal	Leu gag Glu 25 gtc Val) gttc Phe	Pro 10 gca Ala ato Ile His	Let tcc Ser aca Thi	a gat a gat a gat a gg a Gl; a Gl; g ag u Se	t geo Ala 45 45 C cto	tgg Trp 30 ato	t gc	g aag c Lys a gga r Gly	96
age Se: tc: Se ct Le gt Va	t george Ala g gg. u Gl 5 g ct l Le	c ctc y Let c gtc a Val a aaa y Ly: 0 g tg u Cy	c ctc c ctc Leu 20 g cac L Glr g gac s Glu	Ala 5 tto Phe 1 paac 1 paac 1 paac 2	Val att Ile aaa Lys gct Ala gaac Asr 70 t gaa	tac Tyr gto Val cgo Arc Trr	Met cag Gln gtg Val gtg Glg Glg Glg	Leu gag Glu 25 gtc Val Dhe	Pro 10 gca Ala ato Ile His	Let tcc. Ser acae The gc. s Al. g ga Gl 7	e age c Arc a gat r Asi a gg a Gl g ag u Se 5	g ctg g ctg g Leu c gcc Ala 45 t ggg g Gly 0 c ctc	tgg Trp 30 cato Alic tau Ty caa	t gc tca aga Ard	g aag Lys a gga r Gly g ctg g Leu c acc a Thr	96 144 192

gtc Val	Leu	gac Asp 115	tgc Cys	tac Tyr	ggc Gly	tgt Cys	gtg Val 120	gac Asp	atc Ile	ctc Leu	atc Ile	aac Asn 125	aat Asn	gcc Ala	agc Ser	384
gtg Val	aaa Lys 130	gtg Val	aag Lys	G] À ààà	cct Pro	gcc Ala 135	cac His	aag Lys	att Ile	tcc Ser	ctg Leu 140	gag Glu	ctt Leu	gac Asp	aaa Lys	432
aag Lys 145	atc Ile	atg Met	gat Asp	gcc Ala	aac Asn 150	tac Tyr	ttc Phe	gga Gly	ccc Pro	atc Ile 155	act Thr	tta Leu	acc Thr	aaa Lys	gtt Val 160	480
ctg Leu	ctt Leu	ccc Pro	aac Asn	atg Met 165	atc Ile	tcc Ser	agg Arg	aga Arg	aca Thr 170	ggc Gly	cag Gln	att Ile	gtg Val	tta Leu 175	gtg Val	528
aac Asn	aac Asn	atc Ile	caa Gln 180	gcg Ala	aag Lys	ttt Phe	gga Gly	atc Ile 185	ccg Pro	ttc Phe	cgc Arg	aca Thr	gct Ala 190	tat Tyr	gca Ala	576
gcc Ala	tct Ser	aag Lys 195	cat His	gcc Ala	gtc Val	atg Met	ggc Gly 200	ttc Phe	ttt Phe	gac Asp	tgc Cys	ctc Leu 205	cga Arg	gcc Ala	gag Glu	624
gtt Val	gag Glu 210	gaa Glu	tac Tyr	gat Asp	gtt Val	gtg Val 215	gtc Val	agc Ser	acc Thr	gtg Val	agc Ser 220	Pro	act Thr	ttc Phe	atc Ile	672
cgc Arg 225	Ser	tac Tyr	cgt Arg	gct Ala	tcc Ser 230	cct Pro	gag Glu	caa Gln	aga Arg	aac Asn 235	Trp	gag Glu	aca Thr	tcc Ser	att Ile 240	720
tgt Cys	aaa Lys	ttc Phe	ttc Phe	tgc Cys 245	agg Arg	aag Lys	cta Leu	gcc Ala	tat Tyr 250	Gly	gtg Val	cac His	ccg Pro	gtg Val 255	gag	768
gtg Val	gct Ala	gag Glu	gaa Glu 260	Val	atg Met	cgc Arg	aca Thr	gta Val 265	Arg	agg Arg	ı aaçı Lys	aag Lys	caa Glm 270	Glu	gtg Val	816
ttc Phe	atg Met	gcc Ala 275	Asn	ccg Pro	gtt Val	cct Pro	aag Lys 280	Ala	gco Ala	gto Val	g tto L Phe	285	Arç	aco Thr	ttc Phe	864
tto Phe	cct Pro	Glu	tto Phe	ttc Phe	tto Phe	gct Ala 295	a Val	g gto Val	g gco	c tgt a Cys	ggg s Gly 300	y Val	g aaq L Lys	g gaq s Glu	g aag ı Lys	912
	ı Asr			a gaa o Glu		ı Gl										933

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